

## **CLAIMS:**

What is claimed is:

1. An afterburner for an internal combustion engine of a motor vehicle, the afterburner comprising:

a screen affixed to an intake pipe located upstream of an exhaust gas recirculation valve, wherein the afterburner captures and burns particles contained in an exhaust gas stream which are a size large enough to obstruct the exhaust gas recirculation valve.

2. An afterburner as in claim 1, wherein the screen is thimble-shaped.

3. An afterburner as in claim 1, wherein the screen has a mesh size of about 12 to 20.

4. An afterburner as in claim 1, wherein the screen has a minimum size of 5 mesh.

5. An afterburner as in claim 1, wherein the screen has a maximum size of 40 mesh.

6. An afterburner as in claim 1, wherein the screen is affixed to an intake pipe by interference fit.

7. An afterburner as in claim 1, wherein the screen is affixed to an intake pipe by welding.

8. An afterburner as in claim 1, wherein the screen is affixed to an intake pipe by mechanical means.

9. An afterburner as in claim 1, wherein the screen is made from a material with a high thermal conductivity.

10. An afterburner as in claim 9, wherein the screen is made from stainless steel.
11. An exhaust gas recirculation valve system for a motor vehicle comprising:
  - an exhaust gas recirculation valve;
  - an intake pipe coupled to an intake orifice of the exhaust gas recirculation valve;
  - a screen affixed to the intake pipe that captures and burns particles contained in an exhaust gas which are a size large enough to obstruct the exhaust gas recirculation valve.
12. An exhaust gas recirculation valve for a motor vehicle as in claim 11, wherein the exhaust gas recirculation valve is an integral backpressure type valve.
13. An exhaust gas recirculation valve for a motor vehicle as in claim 11, wherein the exhaust gas recirculation valve is a ported type valve.
14. An exhaust gas recirculation valve for a motor vehicle as in claim 11, wherein the exhaust gas recirculation valve is an electronic type valve.
15. An exhaust gas recirculation valve for a motor vehicle as in claim 11, wherein the exhaust gas recirculation valve is a valve and transducer type valve.
16. An exhaust gas recirculation valve as in claim 11, wherein the screen is thimble-shaped.
17. An afterburner as in claim 11, wherein the screen is affixed to an intake pipe by interference fit.
18. An afterburner as in claim 11, wherein the screen is affixed to an intake pipe by mechanical means.

19. An afterburner as in claim 11, wherein the screen is made from a material with a high thermal conductivity.

20. An afterburner as in claim 19, wherein the screen is made from stainless steel.

21. A method of afterburning large particles in an exhaust gas stream of an internal combustion engine, the exhaust stream comprising at least one molar percent oxygen, the method comprising the steps of:

heating a perforate afterburner located within the exhaust gas stream to a temperature high enough to burn large particles;

capturing large particles contained in the exhaust gas stream with the afterburner;

holding the captured particles with the afterburner for a sufficient time to burn the large particles to a size they can pass through the afterburner.

22. A method of afterburning large particles in exhaust gas stream as in claim 21, wherein the afterburner is heated to a temperature of at least 900°F.